California Citrus Export Challenges

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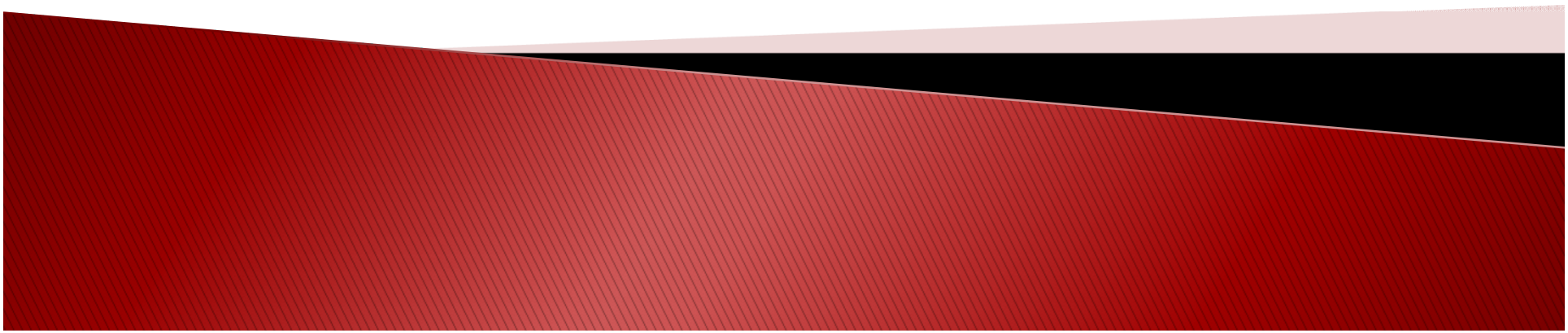
California Citrus Quality Council



Keep in Mind…

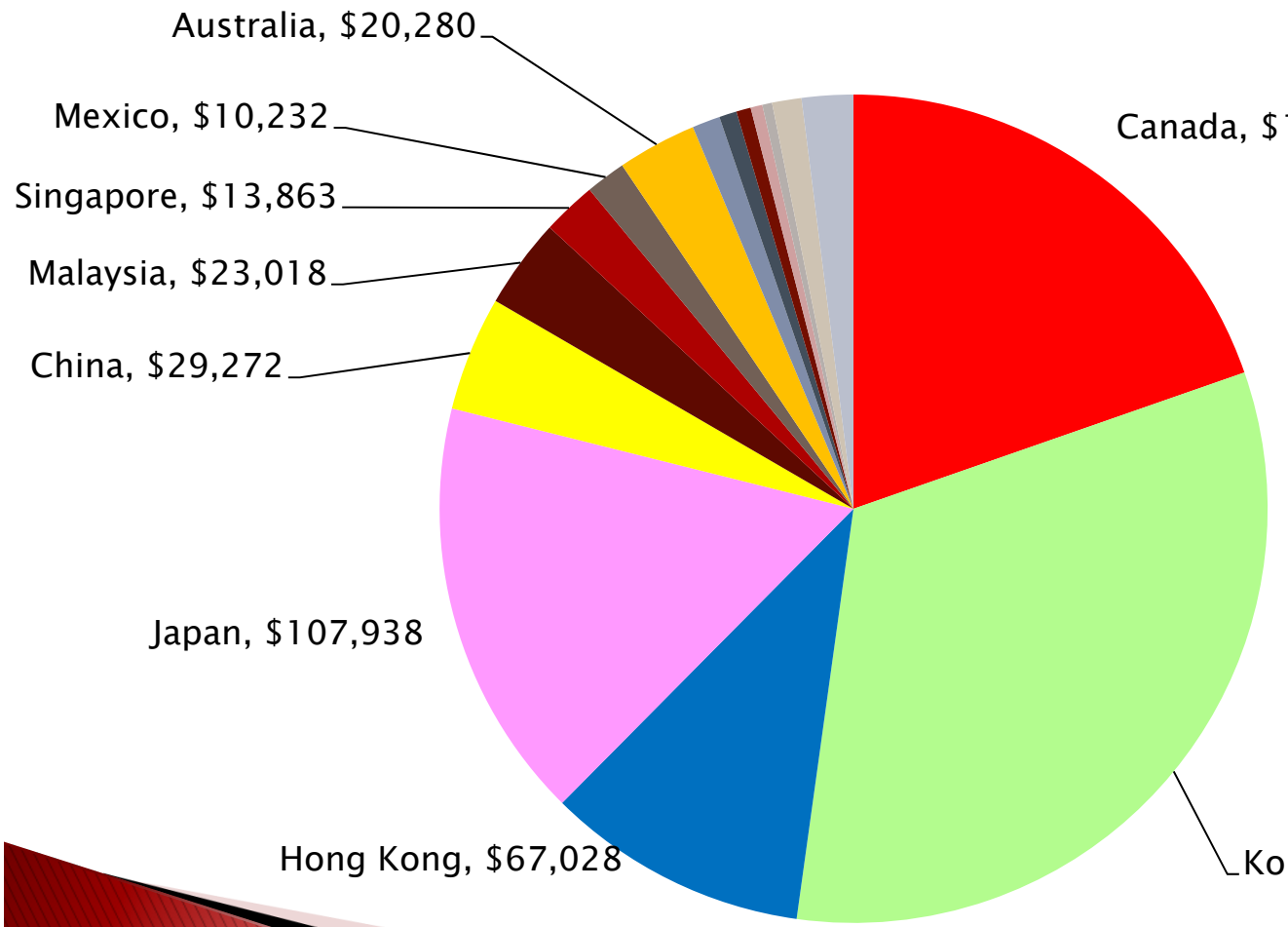
- Exports are the “cream” of the crop
- It may take select production from several groves to fill export orders
- Difficult to designate specific groves for specific export markets
- **Production can go anywhere**
- **Pesticide residues should be “legal” anywhere; including post harvest fungicides used in packing houses**

Export Challenges

- Maximum Residue Limits (MRL)
- Phytosanitary issues
- Food Safety

Top Orange Export Markets

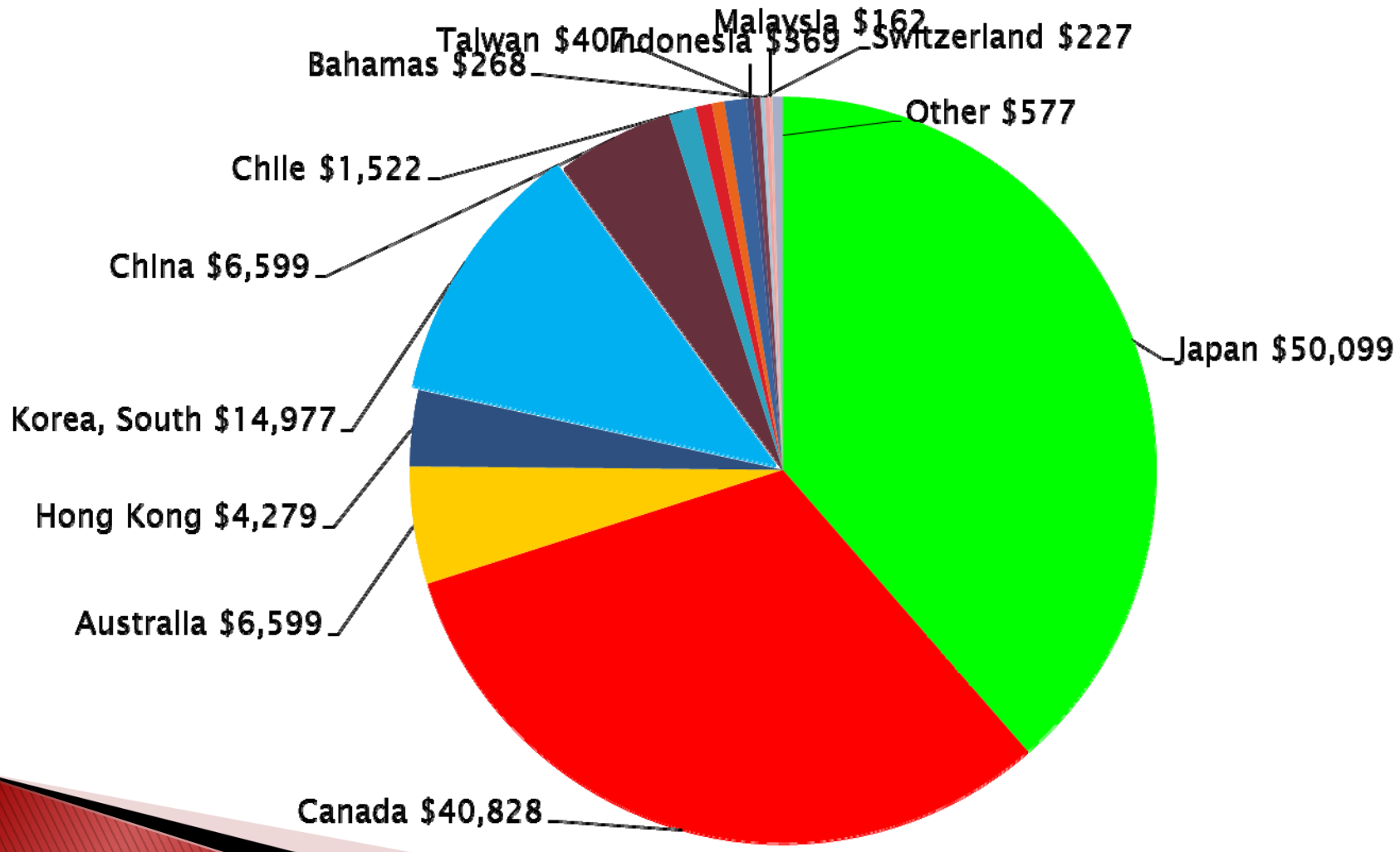
(Thousand U.S. Dollars)



- 30 percent of crop is exported.
- 40 percent of revenue is from exports.

Top Lemon Export Markets

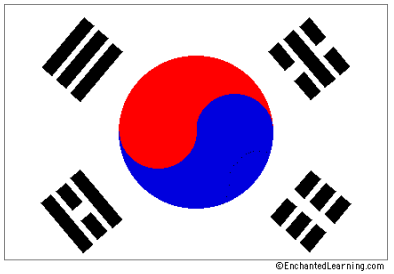
(Thousand U.S. Dollars)



Export Market Issues

- Canada – removal of default MRL
- Korea – transition of FRB control measures from Korea to California; new MRL setting process nearly 60 MRLs will be needed
- China – ongoing market access problems
- Hong Kong – new MRL system; new chemicals?
- Japan –food additive tolerance reform needed
- Australia & New Zealand – Bean thrips, mites and ACP

Korea Export Issues



- *Septoria* – quarantine disease
- Copper & fungicide applications
- Copper phytotoxicity
- Need more fungicide MRLs

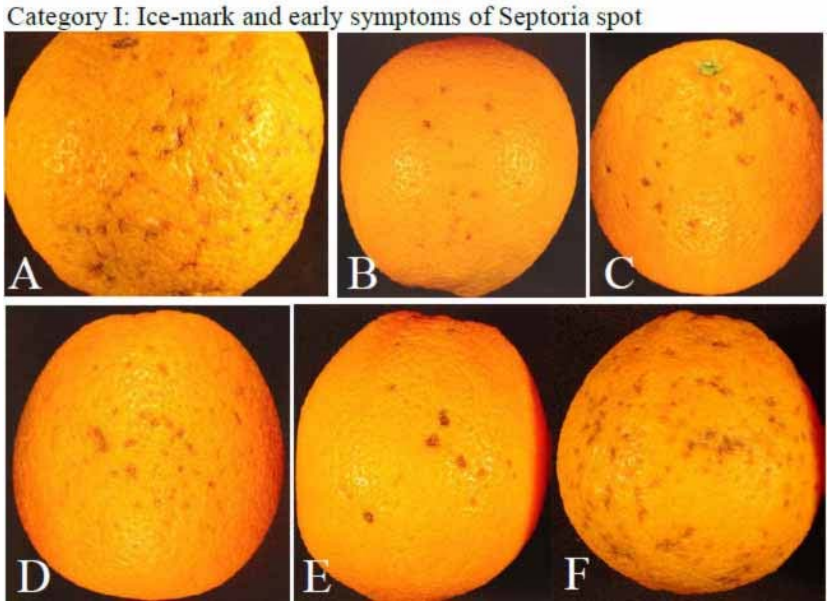
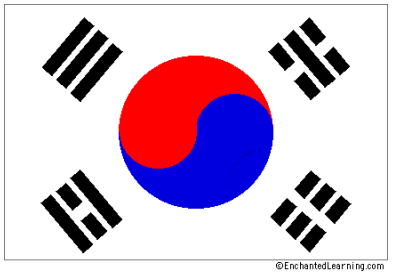


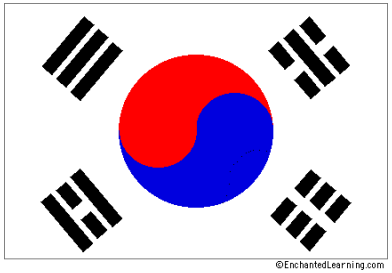
Photo: Adaskaveg

Korea Export Issues



- Fuller Rose Beetle & Ca Red Scale
  - Will require control in California
  - Skirt pruning, weed control, foliar applications, post harvest treatments
- MRLs needed
- CRS tools failing

Korea MRLs



- Korea's Food and Drug Safety (KFDS) is establishing its own MRL setting process
- Implementation expected in Dec. 2018
- Korea will not defer to Codex in the future
- CCQC is identifying priorities for import tolerances in Korea 60 MRLs needed
- Need help from registrants

China

- Ongoing interceptions of Phytophthora
- Market insecurity
- Estimated $70 million market

Phytophthora Symptoms

Challenges

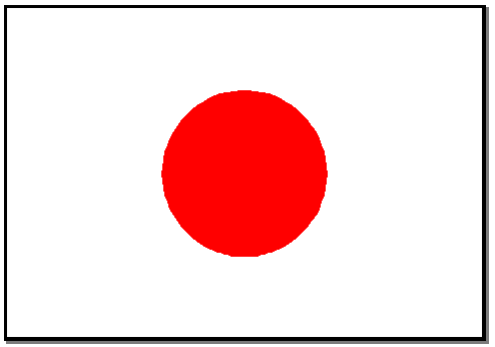
- Registration in China
  - Requires data developed in China
- No Import Tolerance Process
- No MRLs for Alternative Fungicides

Phytophthora Symptoms

Potassium Phosphite Postharvest Treatment

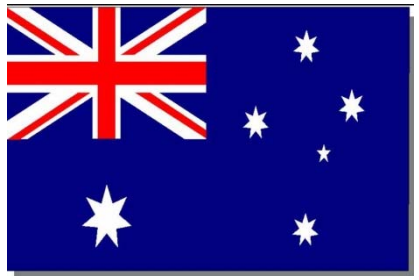
- MRL needed for China phytosanitary issue
- Need MRL for Korea
- Postharvest treatment requires food additive tolerance in Japan

Japan



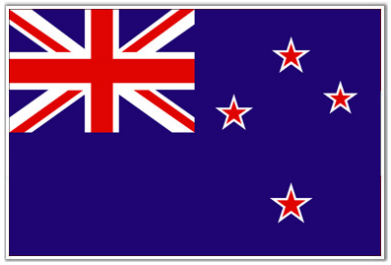
- Food additive tolerance problematic
  - Long review time
  - Minimal interest from registrants – ROI
  - Requires complex carton labeling
  - Requires posting retail advisory

Australia Export Issues



- Bean Thrips – quarantine insect pest
- Mites
- Sweet Orange Scab

New Zealand Issues



- Bean Thrips
- Mites
- ACP
- Mite research underway

Citrus Greening (HLB) & Asian Citrus Psyllid (ACP)

HLB Symptoms

Healthy

Infected

Future Implications HLB & ACP

- More pesticide applications
- IPM disruption
- Potential MRL violations
- More MRLs needed

Food Safety

- Food Safety Modernization Act
- Fresh produce microbiological regulation
- Growers and packers
- Complex regulations

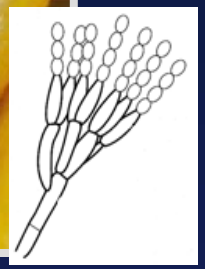
Food Safety (continued)

- Food safety legislation requires overseas compliance
- **Reaction expected**
  - Korea food facility registration
  - China food safety law
- New source of trade irritants or trade barriers
- U.S. implementation will be critical

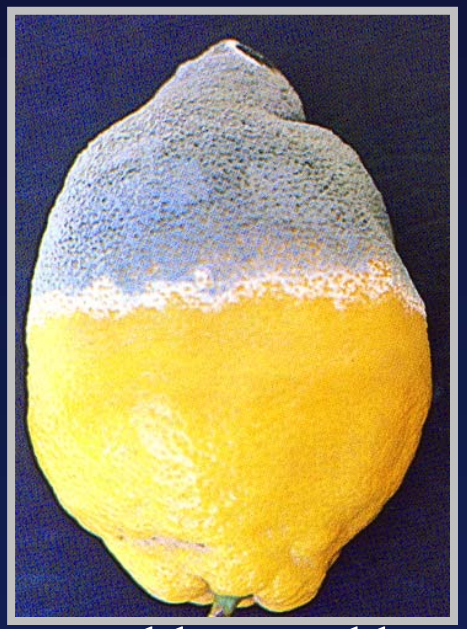
Postharvest Fungicide Problems

- Unlike preharvest insecticides, residues are desirable
- Can't be too low or too high
- MRLs are critical
- Food additive regulations in Japan – major problem
- Packinghouses can't segregate for specific markets

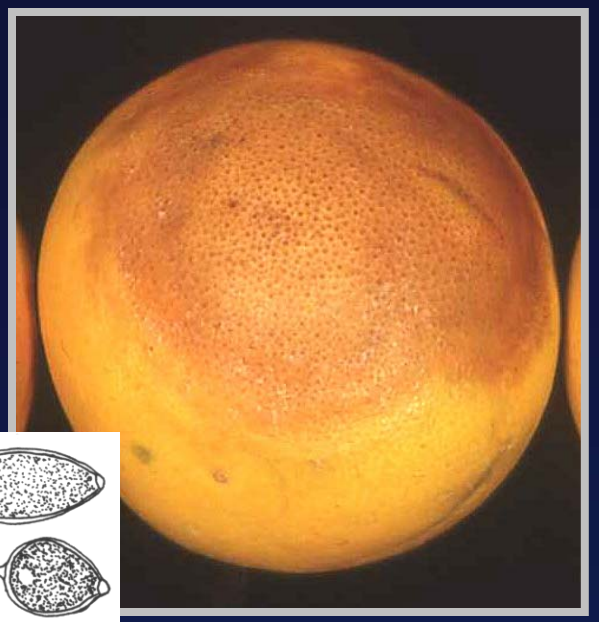
Postharvest decays of citrus



Green mold caused by *Penicillium digitatum* (most important on citrus)



Blue mold caused by *P. italicum* and green mold



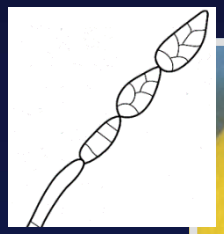
Brown rot caused by *Phytophthora* spp. Infection through intact tissue.

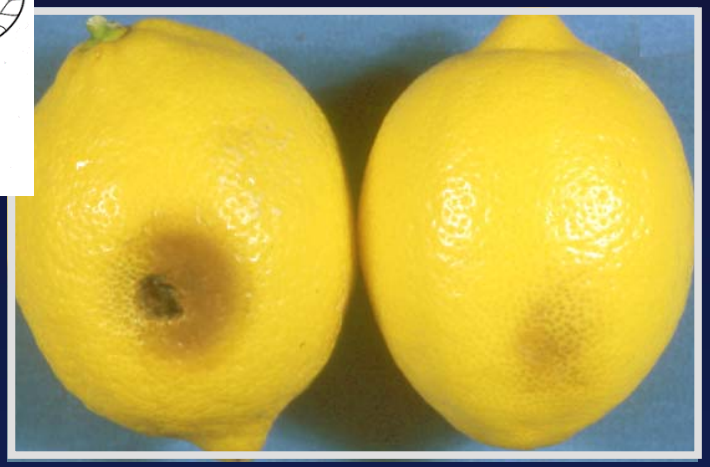
Penicillium spp. are wound pathogens

Penicillium soilage

Major postharvest decays of citrus

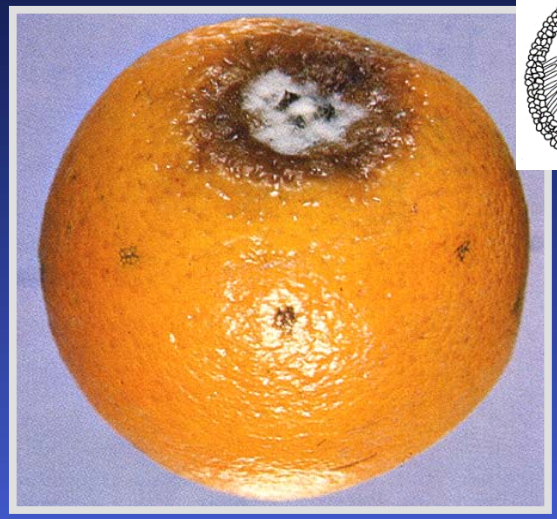
Sour rot caused by *Geotrichum citri-aurantii*





Alternaria decay caused by *Alternaria* sp.

Tear stain and anthracnose caused by *Colletotrichum gloeosporioides*



Stem end rot caused by *Lasiodiplodia theobromae (B. rhodina)*

Sour rot decay of lemons (some Penicillium decays) “melting-down” of fruit

Penicillium decay of lemons in storage

Cull pile of lemons with decay

Close-up of cull pile of lemons with mostly Penicillium decay (green and blue molds)

Usage of borax, sodium carbonate (soda ash), and sodium bicarbonate in postharvest treatments of lemons

Application methods for postharvest fungicide treatments

Low-volume spray application
(Controlled droplet application - CDA)

Application methods for postharvest fungicide treatments

Flooder application

Postharvest fungicide treatments as a component of postharvest handling
Example: Lemons in California

Fruit arrival

→ Sorting

Chlorine wash, soda ash treatment, water rinse

Application of fungicide and fruit coating

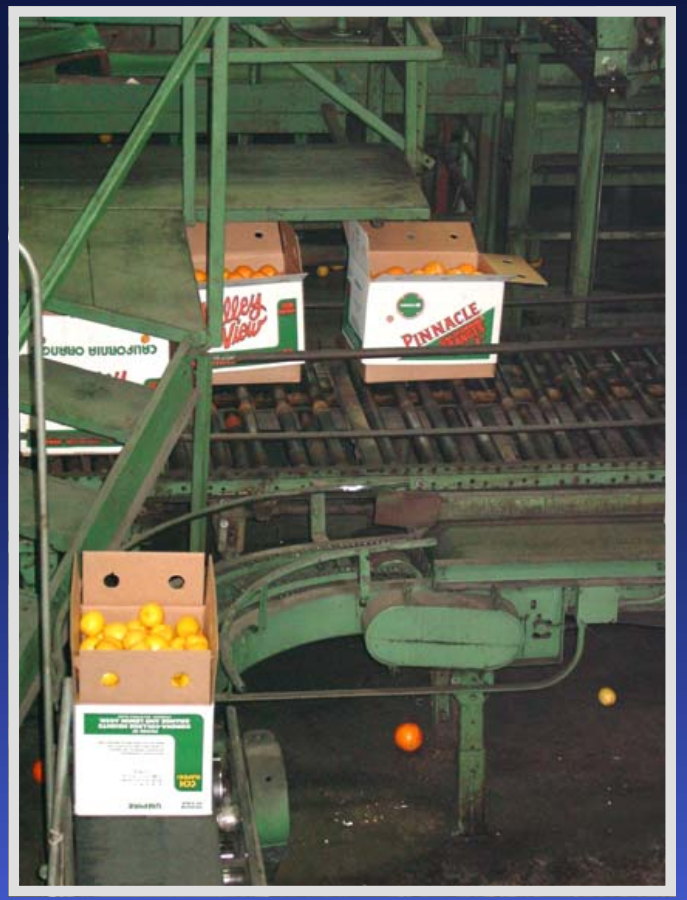
Storage wax application

Bulk packing in bins

Storage for up to 3 months

Pack wax application

Boxing, shipping, marketing



Chlorine wash after storage

Sorting

Fungicide and pack wax application

Boxing and marketing

Conclusion…

- Postharvest fungicides are critical for high quality exports
- Distance and long transit times can diminish quality
- Adequate fungicides needed for resistance management
- Fungicide MRLs are critically important

What will the future bring?

- MRLs – ongoing irritant
- Potential food safety trade barriers
- Need EPA & FDA leadership
- Analytical methods
- Global reviews?
- Harmonization?

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Thank you

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